A
SHORT AND EASY
INTRODUCTION
TO
SCIENTIFIC AND PHILOSOPHIC
BOTANY.

BY SAMUEL SAUNDERS.

Manifold are thy works, O LORD! In wiſdom thou haſt made them all. PSALMS.

Nature, thy daughter, ever-changing birth
Of THEE, the *Great Immutable!* to man
Speaks WISDOM; is his oracle ſupreme;
And he who *moſt* conſults her, is *moſt wiſe*.
YOUNG.

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1792.

BRITISH MUSEUM

TO

JAMES EDWARD SMITH,

M.D. F.R.S. &c. &c.

PRESIDENT OF THE LINNÆAN SOCIETY,

THE FOLLOWING LITTLE WORK

IS MOST RESPECTFULLY DEDICATED,

IN TESTIMONY OF THE HIGHEST ESTEEM,

AND THE WARMEST AFFECTION,

BY

HIS MUCH OBLIGED FRIEND AND SERVANT,

S. SAUNDERS.

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PREFACE.

THE following mite is reſpectfully caſt into the treaſury of literature, in humble hope that it may prove a conciſe, intelligible, and eaſy manuduction to the acquiſition of the moſt pleaſing branch of natural hiſtory.

The writer has long wiſhed to ſee ſomething executed on a ſimilar plan, but nothing directly of this kind having come to his knowledge, he offers the preſent attempt; and it will give him much pleaſure to hear that it has been found uſeful in facilitating the progreſs of any lover of this delightful, amuſing, and inſtructive ſcience; or in exciting any perſon ignorant of it, to taſte the moſt refined and exalted pleaſures that fields and gardens can convey.

He has given the *Linnæan* names, to which ſo much objection has been made, an Engliſh, and an eaſier ſound (adding all along the original terms), which, he hopes, will prove more acceptable to learners, and thereby render the acquiſition of the ſcience leſs difficult and diſcouraging. He has, moreover, introduced the ſyſtem of the immortal LINNÆUS by that of the illuſtrious TOURNEFORT, in a mode, *he* conceives, in ſome meaſure neceſſary to a ſcheme of this ſort; and, as appears to *him*, quite eaſy and natural.

LEATHERHEAD,
Nov. 1, 1791.

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INTRODUCTION
TO
SCIENTIFIC AND PHILOSOPHIC
BOTANY.

The Term Botany is derived from a *Greek* word of ſimilar orthography, ſignifying an *Herb* or *Plant*; and includes, as its object, the ſcience of Vegetables, reſpecting their *Names*, *Habits*, *Families*, *Claſſes*, *Orders*, *Genera*, *Species*, and *Varieties*.

The Vegetable Kingdom is diviſible into ſeven tribes or families; compriſing,

1. Palms.
2. Grasses and Corn.
3. Flags.
4. Ferns.
5. Funguses.
6. Mosses. And
7. Trees and Shrubs, both deciduous and evergreen: including all Herbaceous Plants, whether annual, biennial, or perennial. *

Botaniſts

* By *annual plants* is meant such as perish within the compaſs of a year.

Biennial. such as exist 2 Years

Perennial, enduring more than 2 Years.

Evergreens are call'd *Sempervirent*

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The caudex is the body of the root, & is that part from which the Stem ascends, & Radicles descend.

The Radicles are the stringy parts of the root.

Botaniſts divide plants into, The *Root.* The *Trunk, Stem,* or *Stalk.* The *Leaves.* The *Supports.* The *Winter Quarters.* And the *Fructification.*

I. The Root is the baſis of the plant by which it is fixed in the earth, and whereby its nouriſhment is derived.

Roots are divided into two general parts: the body *(Caudex)*, and the fibrous part or *Radicle*; of which every fibre, as ſo many mouths, abſorb the nutritious juices of the earth, in order to their tranſmiſſion to every part of the plant.

Roots are alſo diſtinguiſhed, according to their forms, into fibrous, bulbous, and tuberous.

A *Fibrous* root is compoſed of many ſmall, ſtringy fibres, which numerouſly divide from the ſtalk, as their common center. Theſe are, moreover, conſidered, according to their *conſiſtence* and *direction*, as *fleſhy* and *perpendicular*; thence called tap, or ſpindleſhaped *(fuſiform)* roots, of which the Carrot and Parſnep are inſtances; *horizontal* or *ſpreading*;

ſpreading; and *capillary* or *hair-like*, roots; and ſuch as proceed from the joints of trailing ſtems in contact with the ground; thence termed *repent*, or *creeping* roots.

A *Bulbous* root is compoſed of a large roundiſh body, and many fibres or radicles iſſuing from it; diſtinguiſhed into *ſolid*, as the crocus; *coated*, as the onion; *ſcaly*, as the lily; *double*, as the orchis; and *cluſtered*, as the white ſaxifrage; which, by reaſon of the ſmallneſs of its bulbs, is among thoſe called

Orchis
a beautiful
Tribe of Plants.

granulous, from their reſembling grains or ſeeds.

A *Tuberous* root conſiſts of ſeveral fleſhy knobs or tubers; theſe are either *ſeſſile*, *ſitting cloſe* to each other, as in the garden ranunculus; or more diſtantly united by ſtrings, as in the pæony, thence termed *pendulous* tubers.

Roots are to plants what lacteals * and abſorbing veſſels are to animal bodies: they imbibe and abſorb the moiſture of the earth, and puſh it forward through the larger branches and body of the root, to the trunk; and ſo to every part of the plant. It is firſt received by the extreme ramifications of the radicle, as by ſo many mouths, or lacteal veſſels of the *firſt* order; whence it is propelled to the larger branches of the root, as lacteals of the *ſecond* order; and from them is received

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* Veſſels in animal bodies opening into the inteſtines, and receiving from them the *Chyle*, or nutritious matter formed from the food,

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food, by the action of the ſtomach and bowels; which being white, reſembling *milk*, they have obtained the name of *lacteals*.

by

by the *deſcending* part of the body of the root, as into a STOMACH, where it undergoes the firſt operations of the digeſtive proceſs, which prepare it for reception into the *aſcending* part of the body of the root, or that part riſing to, and a little above, the ſurface of the ground; by ſome called the *crown*; which, as it poſſeſſes, in an eminent degree, the vital principle of vegetation, may be called the HEART of the plant, where the ſanguification of it properly begins.

II. The TRUNK, STEM, or STALK.

In trees, and larger plants, the former term is uſed; but in thoſe of leſs procerity and magnitude, the latter chiefly obtains. It is the diviſion of the plant which ariſes immediately from the root, and elevates the leaves and the fructification, by which it is commonly terminated.

The ſtem or ſtalk is occaſionally denominated *Culm, Scape,* and *Frons.* The *Culm* is the peculiar ſtem of corns and graſſes, elevating the leaves and fructification: it is either uniform

form, knotty, or ſcaly. The *Scape* is that which ariſes naked and ſmooth from the root, and elevates the flower, but not the leaves; as in the Narciſſus. The *Frons* is a peculiar mode of growth, conſiſting of a mixture of branch and leaf, exhibiting the appearance of a compound leaf bearing the fructification. The Ferns are examples of it.

The trunk of trees and ſhrubs (and we conceive, from analogy, the ſtems of all the leſſer orders of plants alſo) conſiſts of ſeveral diſtinct parts,

viz.

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+ In herbaceous plants the bark is scarcely to be distinguish'd fm the wood. In some roots as the carrots &c: it is extremely thick the *yellow part* is the wood, the *red* the bark.

‡ This is the part which was used by the antients to write upon. The paper in England known by the name of *China paper* is suppos'd ~~is supposd~~ to be made of the bark of some particular tree.

This liber is renew'd every year & that during the winter: But the wood is form'd in the height of Summer. ——

viz. The *Bark.* The *Wood.* The *Sap*, or *Blood Veſſels.* The *Pith.* The *Tracheæ*, or *Air veſicles*; and the *Web*, or *Tiſſue.*

+ The bark conſiſts of two, and ſometimes of three, parts. 1. The external rough, brown, coat called the *Cortex.* 2. The internal green, or greeniſh white coat, termed *Liber.* ‡ And, 3. In ſome of the harder woods, a ſoft white inveſture, called, from its appearance, *Alburnum:* which is indeed no other than the wood not yet arrived at maturity; and which ſome botaniſts have thought, from its whiteneſs and ſoftneſs, to be analogous to the fat of animals. Each of theſe coats, as age advances, becomes hard and compact, forming a part of the woody ſubſtance of the plant. (see page 14.)

The bark (as well as the wood) is ſupplied with innumerable veſſels which convey fluids to and from every part of the plant; the wood is moreover furniſhed with another ſeries, which contains air, and is every where diſtributed through its ſubſtance.

The Fluids of plants are, the SAP, analogous to the *Blood* of animals, and the PROPER JUICE, which ſeems to reſemble their *ſecreted Fluids*, and is of various colours and conſiſtence in different individuals; as *white*, in the Dandelion. *Yellow*, in the Celandine. *Green*, in the Periwinkle. *Red*, in Logwood. *Mucilaginous* in the Marſhmallow; and *reſinous* in the Fir.

The barks of plants ſeem to ſerve to them for the uſes which the true and ſcarf ſkins do to animal bodies: they inhale, exhale, inveſt, and defend.

The web or tiſſue is a ſort of vaſcular membrane, originating from the wood, and diſtributed through the plant in form of a very fine and attenuated ſeries of veſſels, whoſe chief uſe ſeems to be that of ſupport to the pith. The air veſicles ſerve as bronchial veſſels to receive, percolate, aſſimilate, and tranſmit air.

* The wood conſtitutes the ſtability and ſolidity of trees and ſhrubs: it admits veſſels the ſame as the bark; of which the older and firmer

* The wood in annual plants is scarcely to be distinguish'd from the bark, & consists in them of but one layer, but in trees & shrubs, it consists of many layers, & of these one is added each year, consequently we may know the age of a tree by the number of layers which exist, forming sort of rings — These rings are found to be broader towards the South than north side.

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er portions, ſerve as *bones*, and the more tender and flexible, as *muſcles*, to give action, and ſo to promote the motion of the fluids, and to facilitate and expedite their ſecretions and excretions.

The pith, or medullary ſubſtance, is a fine congeries of veſſels originating in the center of plants; forming the principal bulks of the young and more juicy, and of the ſofter and leſs woody, kinds. In youth it is moſt abundant, and leſs ſo in advancing age. Its texture ſeems to be glandular, and to reſemble the brain and ſpinal marrow in the trunk, and the nervous matter in the remoter parts and ſmall branches, which conjecture is the more probable, as therein the ſeat of life ſeems to be placed.

The ſtems of plants have acquired many names, agreeable to their forms and external appearances; as round, ſquare, knotty, armed, unarmed, ſmooth, rough, branched, unbranched, angular, &c. For a particular detail of which, I refer to thoſe introductory treatiſes fully deſcribing ſuch matters, whoſe plates

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× A branch of a tree may be kept alive for some time, provided two or three of its leaves are suffer'd to be under water. Hence if you wish to preserve flowers, for ornament you should never strip the stem of its leaves

Plants should never be water'd but in the Evening. If the water be not of the cleanest, so much the better.

The upper surface of a leaf is always darker than the under in consequence of the action of light upon it.

give a clearer idea that any mere deſcription can convey *.

The ſtem affords ſeveral ſpecific diſtinctions of plants.

III. The Leaves are the moſt uſeful and ornamental parts of plants: they conſiſt of all the veſſels of

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* Thoſe editions of Miller's Gardeners' Kalender which have affixed to them his Introduction to the Science of Botany, ſupply a conciſe view of theſe matters, with ſeveral plates. But the beſt information will be obtained from Lee's Introduction to Botany, and Rose's Elements of Botany; whoſe deſcriptions are full, and the plates neat and expreſſive.

which the ſtem is compoſed, in a flat and expanded form, except that they abound in the tiſſue, in form of a ſucculent, parenchymous ſubſtance; and receive the excretory ducts, or mouths of the air-veſicles, in greater plenty. Both their ſurfaces are very porous, and inhale and exhale freely *.

In

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* The annual *Sunflower* is ſaid to perſpire in 24 hours ſomewhat above *nineteen times* as much as a man! This matter, in preſence of the light, is pure dephlogiſticated air: conſequently it is a plant highly proper to be cultivated in cloſe, ill aired places—as in different proportions

If we observe Trees which grow against walls they always turn their leaves from it, to where there is most light. —

The plants of the Pea-kind are so sensible, that when the rays of the Sun are very powerful, they close up some of their leaves.

If you derange a branch of a tree so as to alter the position of the leaves, they will resume their former situation in a very short time.

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* The Air which plants give out in the night time is also very unwholesome. There is a particular kind of Tree, at Surinam which grows along the shore, which has prov'd fatal to many Europeans by their sleeping under it. In the day time, particularly in the Sun the air which plants give out is very salubrious. —

‡ A plant may be suffocated by varnishing its leaves over with any oily substance when it becomes quite wither'd & pale.—

In fine weather the exhalation is in greater proportion; in heavy, moiſt, and wet weather, the inhalation exceeds. Under the influence of darkneſs, and in a dull ſtate of the atmoſphere, the perſpiration of plants is peculiarly inſalubrious, and ſhould be avoided by tender and valetudinarian perſons.*

‡The LEAVES of plants anſwer the purpoſes of *lungs*; and by their diſpoſition to be agitated by the

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portions of health and ſtrength, it will grow and flourish in *any* ſoil or ſituation.

When water is in a putrid state it is again render'd fit to drink in consequence of small seeds (Conferva) which vegetate in it and give out a considerable quantity of pure Air. —

wind, in ſome ſort, ſerve alſo thoſe of *muſcles*, and muſcular motion. They have, moreover, various deſcriptive names both general and particular; as *Simple*, *Compound*, *Winged*, reſpecting their forms:—and, reſpecting their ſhapes and ſurfaces, are diſtinguiſhed into *rough*, *ſmooth*, *hairy*, *ſerrated*, *waved*, *cut*, *notched*;—*round*, *oval*, *heart-ſhaped*, *ſword-ſhaped*, *halbert-ſhaped*, *hatchet-ſhaped*, *tongue-ſhaped*, &c. for all which particulars I refer to the plates and deſcriptions in the treatiſes already recommended, and others of the ſame deſcription *.

On the leaves, principally, the *Species* of LINNÆUS are founded.

IV. THE SUPPORTS, OR PROPS, (*Fulcra*) are certain minute external parts of plants which ſerve the purpoſes of ſupport, and of defence from injuries and enemies; or for the ſecretion of ſome fluid diſagreeable and annoying to certain inſects inimical to them: Theſe are

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* To learners of Botany, I hope to be pardoned if I take the liberty of recommending ROUSSEAU's *Letters to a Lady on Botany*—tranſlated, amended, and compleated, by Mr. MARTYN, the preſent ingenious profeſſor of Botany in the Univerſity of *Cambridge*.

1. *Arms:* * a general term for the *offenſive* parts of plants; ſuch as thorns, prickles, ſtings, &c.

2. *Pubes:* hair or down; a general term for the *defenſive* parts of plants; ſuch as hairs, wool, a certain hoary whiteneſs, hooks, briſtles, glands, clammineſs, and viſcidity.

3. *Tendrils* or *Claſpers (Cirrhi)*: ſmall ſpiral ſtrings by which flexuoſe plants ſuſtain themſelves by

embracing

* as in the black thorn, Rose, sweet Briar &c: — see the note of the next page.

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embracing trees, ſhrubs, and other ſupports.

4. *Floral Leaves (Bracteæ)* are ſmall leaves ſeated near the flower, ſmaller, and frequently differently formed from the leaves of the plant, and ſometimes coloured.

5. *Scales (Stipulæ)*: ſmall leafy appendages ſituated on either ſide of, or a little below, the leaf, for its protection, when firſt emerging from the bud.

6. *Footſtalk (Petiolus)*: this ſupports the leaf, and ſerves the office of a defender and nurſe to the infant

ſant bud, which reſts upon it, as well as that of a channel of conveyance for the nouriſhment of the leaf which it ſupports, of which it properly is a continuation, and to which it gives, by reaſon of its flexibility, a conſiderable quantity of motion.

7. *Flower-ſtalk (Pedunculus)*, or Footſtalk of the flower and fruit. This is called the *common* or *general* flower-ſtalk, or peduncle, when it ſupports other ſmaller ones; and the *partial* or *particular* one, when it elevates a ſingle flower, and is itſelf

The arms or weapons of plants may be seen in the common black thorn &c: In this and many others they arise from the wood; when this is the case they often disappear by culture. This is call'd the taming of the plant.

When these weapons arise from the bark as in the Rose sweet briar &c: they always remain; hence those who are fond of indulging themselves in the dreams of fancy have call'd them ferocious plants. If we indulge in these reveries, & wanderings of the imagination, it is as well to give it at once a full scope, I therefore shall take the liberty of calling them the Hyænas of the vegetable kingdom — The black thorn &c: may be of the Lioni kind— The primrose, violet, Daisy & many of these harmless beings may be of the Sheep kind. ——

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Botanists distinguish Buds into three kinds (viz) 1 – Gemma florifera those which contain the rudiments of the flower —— 2. Gemma folifera containing the rudiments of the future leaves —— 3. Gemma florifera, & folifera, containing the rudiments of the flowers & leaves ſelf ſupported by another peduncle, or general flower-ſtalk. The ſupports afford *ſpecific* diſtinctions of plants.

V. THE WINTER QUARTERS (*Hybernacula*) are parts of plants which defend the embryo ſhoot from the ſeverity of the winter ſeaſon. They conſiſt of a *bulb* and a *bud*. Bulbs are, properly, but large buds, eyes, or gems, including the future plant in their boſoms*: they conſiſt of coats or ſcales. Buds incloſe the ſucceeding year's ſhoot, which is a real and perfect plant, within ſeveral leafy, or ſcaly coverings *. To this denomination properly belong, at leaſt officially, nuts, ſtones and kernels, cones, catkins, and whatever elſe anſwers this end;

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* The *Bulb* is only a ſucculent cover to the infant ſtem incloſed within it. The *root* conſiſts

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conſiſts of the broad *Caudex*, whence the young ſtem proceeds, and the Fibres iſſuing from it.

* This is clear from the eaſy propagation of plants from their buds. Buds and offsets are living Fœtuſes, and may be termed the *viviparous* part of the vegetable kingdom, as ſeeds are the *oviparous* part of it.

though

Buds are only found in Trees of ~~warm~~ cold climates, & serve to defend the young leaves or flowers &c: from the excess of cold & moisture Examples may be seen in the Horse-chesnut.

In some plants the parts within the bud are cover'd with a kind of very soft wool which protects them from the injurious effects of cold &c: —

The Buds are situated just above the insertion of the old leaf. Those which are to unfold the ensuing year are form'd during the Summer of the present year

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though ſtrictly confined to the ideas of Bulb and Bud. Theſe alſo give *ſpecific* diſtinctions.

VI. THE FRUCTIFICATION includes the flower and fruit, and is the part appropriated to generation and propagation.

The parts of it, as enumerated by LINNÆUS, are ſeven.

1. The Cup, or Empalement *(Calyx)*.
2. The Bloſſom, Petals, or Flower-leaves *(Corolla)*.

3. The Threads, or Chives (*Stamina*).
4. The Style, or Pointal (*Piſtillum*).
5. The Seed-veſſel (*Pericarpium*).
6. The Seed, or Fruit.
7. The Receptacle, or Baſe, on which the other parts are ſeated (*Receptaculum*).

I intend to conſider this important part of our ſubject reſpecting, firſt, the *form*, and then the contents of the flower; and ſo to take a view of the ſyſtems both of TOURNEFORT and

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and LINNÆUS, exhibiting the former as introductory to the latter.

TOURNEFORT conſiders the fructification principally with reſpect to the *form of the flower*; and has, conſequently, eſtabliſhed his method of arrangement upon the *bloſſom*, which he has divided into twenty-two claſſes, in the following order.

I. FLOWERS HAVING ONE PETAL* (*Monopetalous*).

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[*] Monopetalous Flowers are divided into two parts—the tube (*Tubus*); and the border or edge (*Limbus*).

CLASS I. *Campaniform*, or *Bell-ſhaped* flowers.

This claſs conſiſts of ſuch flowers as anſwer to its name, forming the reſemblance of a *bell*, whether hanging down, projecting forwards, or ſtanding erect. The Canterbury bell is a fair example of it *.

CLASS

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* Divers flowers of this form vary from the true and exact bell-ſhaped: ſome have a conſiderable ſwell, as if inflated, in the body of the flower, exhibiting the compound form of a *bell* and a *globe*, with a narrow flattiſh rim:—theſe are, therefore, termed *globular bell-ſhaped*. Others have a narrow body and a wide

Class II. *Infundibuliform*, or *Funnel-ſhaped* flowers.

This claſs compriſes ſuch flowers as have a long tube, and a broad open rim reſembling a *funnel*, inſtanced in the Marvel of Peru.

Class III. *Hypocrateriform*, or *Salver-ſhaped* flowers.

This claſs acknowledges ſuch flowers as have a broad, expanded,

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a wide expanded flattiſh rim, and are called *patent* or *open bell-ſhaped*. And ſeveral have a conical tube, ending almoſt in a point, thence termed *tubular bell-ſhaped*.

flat rim reſembling a *ſalver*, with either a long or a ſhort tube. Of this ſort the Periwinkle and Lychnidea, or Baſtard Lychnis, are examples *.

CLASS IV. *Anomalous* or *irregular-ſhaped* flowers.

This claſs receives all ſuch flowers of one or more Petals which are reducible to no particular form or deſcription. Toad's Flax, and Columbine,

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* There are flowers of one petal, which are deeply divided above into five portions reſembling the ſpokes of a wheel, or the points of a ſtar, though united below into a ſhort tube:—theſe are named *wheel-ſhaped* flowers. Borage and Night-ſhade are examples.

lumbine, are examples of it, in either inſtance.

Class V. *Labiate*, or *Lip-ſhaped* flowers.

All ſuch flowers as have two lips, one projecting beyond the other, and leaving a large open ſpace between them, reſembling an open or grinning mouth (thence termed *ringent* or grinning), are arranged under this claſs. The ſuperior lip is called the *Helmet*, and the inferior one the *Beard*:—the open cavity between them is termed the *Fauces*, or throat of the flower. The Dead

Nettle, or Archangel; and the Burgamot, or Lion's Tail, are examples in point.

To this claſs belong alſo the *perſonate* or *maſked* flowers; ſo called becauſe their under lip is folded inward and backward, ſo as to hide the *Threads* and *Style*, which are open and viſible in the foregoing diviſion. This kind is exemplified in the Cow-wheat *.

II. FLOWERS

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* This diviſion receives its name from *Perſona*, a maſk, becauſe, as ſome think, the internal part of the flower is concealed from view.

Burgamot, Pear, or Lion's Tail - two difft.
plants.

II. FLOWERS WITH SEVERAL PETALS* (*Polypetalous*). as in the Primrose &c:

CLASS VI. *Cruciform*, or *Croſs-ſhaped* flowers.

Such flowers as have four Petals ſtanding oppoſite to each other, form-

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view. Others imagine it to take its name from the Roman Maſk, which has a large, tranſverſe fiſſure, or mouth-hole, which theſe flowers are ſuppoſed to reſemble. Others, again, becauſe the word ſignifies a *Reſemblance* or *Counterfeit*, think that it refers to ſome ſimilitude; hence the *Snap-dragon* has been called Frog's-mouth, and Calves'-ſnout.

* Polypetalous flowers are divided into the Claw or Shank (*Unguis*); and the border (*Lamina*).

ing a *Croſs*, compoſe this claſs. Single Stock, Wall Flower, and all the Cabbage ſpecies, are examples.

Class VII. *Roſaceous* or *Roſe-ſhaped* flowers.

This claſs owns all ſuch flowers as conſiſt of five or more petals ſtanding in a circular form, reſembling a flowery crown. The ſingle Roſe, and Strawberry bloſſom, are examples of it *.

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* It is worthy of notice, that *ſingle* flowers only are received as botanical examples: the *double* and *full* ones are either the ſport of nature, or the effect of art.

[illegible] VII. [illegible]

[illegible]

Their [illegible] had general and [illegible] [illegible] [illegible] and for each [illegible] of the same, [illegible]

[illegible]

CLASS VIII. *Umbellate*, or *Umbelliferous* flowers.

Theſe grow on flower-ſtalks both general and particular, forming a flattiſh head or tuft of flowers reſembling an umbrella; and are each very ſmall, conſiſting of five petals, ſometimes regular, and at others irregular, in point of ſhape and ſimilarity to each other. Parſnep, Carrot, Parſley, and Hemlock, are examples *.

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* See the article *Infloreſcence*, No. VIII. at the end of this treatiſe.

Class IX. *Caryophyllous*, or *Clove-ſhaped* flowers.

This claſs includes ſuch flowers as have five or more petals with long narrow ſhanks, often indented at the edges, and ſet in a deep, cylindrical cup. The ſingle Pink, Carnation, and Sweet William, are examples.

Class X. *Liliaceous*, or *Lily-ſhaped* flowers.

This claſs compriſes thoſe flowers that have ſix petals ſo placed as to reſemble a *bell*, and are void of any cup; which, and their not being monopetalous, precludes them from a

place

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many flowers, if not all, droop or close up themselves at the approach of rain, & towards the Evening. This is call'd the sleep of plants.

* Those plants of the Pea-kind bear butterfly-shaped flowers.

place in Class I. though in form they reſemble each other. Tulip and Lily are examples.

Class XI. *Papilionaceous*, or *Butterfly-ſhaped* flowers.

This claſs receives its name from the reſemblance of its flowers to a *Butterfly* (*Papilio*).* They conſiſt of three parts or orders of Petals, each having its diſtinct name:—the largeſt and hindmoſt, is called the *Banner* * (*Vexillum*); becauſe ſtrongly ly fixed, and placed as if to defend and protect the reſt. The two lateral ones are termed the *wings* (*alæ*), and the central one the *keel*

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* Theſe flowers, ſupported by a ſlender and verſatile footſtalk, are capable of much and various

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various motion. In wet and ſtormy weather the flower turns its back to the ſtorm, while the banner enfolds the wings, by cloſing about them, and ſo partly covers them, whilſt they do the ſame office to the *keel*, containing the more important parts of the fructification; thus preſerving the flower from its enemies, wet and wind: and when the ſtorm is over, and fair weather returns, the flower changes its poſition, expands its wings, and erects its banner, as before! This is one inſtance, among many, of the *ſenſibility* and *irritability* of plants.

(*carina*),

(*carina*), from its reſemblance to a boat. Of this form the *Pea Blooms* are the more perfect examples; the ſweet ſcented pea, as among the largeſt, the moſt ſo.

Class XII. *Floſculous*, or *tubulous* flowers.

This claſs conſiſts of very ſmall tubular flowers, or florets, of which many are collected into one head, and are fixed into one large, broad baſe, each being a perfect flower, containing *Threads* and *Style*. The Artichoke and Thiſtle are examples.

Class XIII. *Semifloſculous* flowers.

This claſs contains flowers conſiſting of flat, ſtrap-ſhaped flowers, as if they were the foregoing ones divided; though they are all complete, being tubular below, and only flat above: like them, they all form one head, and ſtand on one baſe. Dandelion and Sow Thiſtle are examples.

Class XIV. *Radiate*, or Star-flowers.

Flowers forming this claſs are of the compound kind, containing in one head, and on one baſe, both

[illegible]
the former in the evening, [illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

floſculous and *ſemifloſculous* flowers:—the former in the center, termed the *Diſc*; the latter in the circumference, termed the *Rays*. Sunflower, Aſter, and Daiſy, form examples.

III. FLOWERS WITHOUT PETALS.

CLASS XV. *Apetalous* flowers.

This claſs is compoſed of flowers having no Petals or Bloſſoms *, and which contain only *Threads* and *Styles*. Example, Mares-tail.

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* The *Threads* and *Pointals* are the eſſential parts of the flower; this term, then, will be deemed not an improper one.—The *Petals* are only an internal covering, not, properly, any

CLASS XVI. *Spermatophorous* plants. Or ſuch as produce ſeeds, without any apparent flower; as the Ferns: though no ſeed can be produced without a flower, i. e. *Threads* and *Style*, however inconſpicuous and inviſible;—and theſe examples of TOURNEFORT, glaſſes have ſhewn *do* produce real and perfect flowers,

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any part of the flower at all; there being innumerable inſtances of perfect ſeed where they are wanting.

though not diſcernible by the naked eye.

Class XVI. *Aſpermous* plants. Or ſuch as appear to produce neither flowers nor ſeeds; as Muſhrooms, and many of LINNÆUS's Claſs *Cryptogamia.* Yet theſe bear both flowers and ſeeds, though inviſibly ſmall. —

IV. TREES AND SHRUBS BEARING FLOWERS.

Class XVII. *Amentaceous* flowers. This claſs contains apetalous flowers, which conſiſt of a looſe, pendent ſtring of chaffy ſcales, diſpoſed along a ſlender thread, receptacle, or baſe, which, from its fancied reſemblance to a cat's tail, has been called *Catkin.* The Walnut, and all the ſpecies of Oak, furniſh examples.

CLASS XVIII. *Monopetalous* flowers of various forms; as Honeyſuckle, Jaſſmine, Elder, Privet, &c.

CLASS XIX. *Roſaceous* flowers; as the Peach, Apple, Sumach, Myrtle, &c.

CLASS XX. *Papilionaceous* flowers; as Laburnum, Broom, Furze, &c.

[illegible]
a [illegible]
which, from [illegible]
[illegible] has been [illegible]
[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Class XXI. *Apetalous* flowers; as Aſh, Box, Butcher's Broom, Yew, &c *.

But greater light was reflected on the ſubject by, and farther diſcoveries reſerved for the reſearches of, the indefatigable and ſagacious Linnæus, the great and illuminated reformer of Botany, who, regardleſs of the inconſtant and variable ſtandard of his predeceſſors, has with much more truth, permanency, and nature, founded his ſyſtem, not on *form*, *habit*, or any ſuch uncertain ground; but on the *Stamina* and *Piſtilla* of flowers: parts the moſt uniform, conſtant, and invariable, as well as eſſential; conſequently the ſureſt baſis of any ſyſtem. Theſe I have choſen to call the *contents* of the flower, taking the whole in a general view. In the method of this illuſtrious botaniſt and interpreter of nature, I ſhall now attempt further to conſider the ſubject.

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* I have joined the *anomalous* flowers with *one* or *more* Petals, into one claſs, as I conceive it needleſs to divide them, as Tournefort has done, into *two* claſſes.—By this union, and ſome other little variations, I have one claſs ſhort of his number.

This judicious arranger has conſidered the fructification of plants as diviſible into twenty-four claſſes, built upon the *Stamina*, *threads*, or male parts; and has ſubdivided theſe into various orders, depending, except in a few inſtances, on the *Piſtilla* or female parts. And on theſe, and other parts of the fructification, has eſtabliſhed all his *Genera*, and many of his *Species*, of plants; as on a foundation the moſt ſure, permanent, conſtant, and immoveable.

I ſhall, therefore, after this great example, treat of the ſeveral parts of the *Fructification*, in the ſame order as nature has produced them.

I. The **Base or Receptacle** *(Receptaculum)*, by which the whole fructification is ſupported. It is divided into *proper* and *common*: proper, when it ſupports only one fructification; and common, when it ſupports ſeveral, each having its own proper one. It is, moreover, divided into the *Baſe of the Fruit*, and the *Baſe of the Flower*, when each has its ſeparate one, as is inſtanced in the French Willow, and Evening Primroſe.

roſe. When it ſupports both flower and fruit, as in moſt caſes, it is called the *Baſe* or *Receptacle of the Fructification*.

II. The CUP, or EMPALEMENT *(Calyx)*, is the green cup which incloſes and ſupports the bloom. This term is conſidered by LINNÆUS as a generic one, and diviſible into ſeveral ſpecies, deſcriptive of its peculiar form or texture; a *Perianthium*; *Spatha*; *Gluma*; *Calyptra*; and *Volva*: or, in Engliſh—the common Flower Cup, Sheath, Huſk, Veil, and Purſe:—for the particular explanation of which terms, I refer to the treatiſes already recommended.

The Cup is in ſome inſtances ſingle, and in others double; and in the compound flowers it conſiſts of many pieces laid over, or uniting with, each other in various orders and forms, and of various texture and compoſition; conſiſting of Leaves, Scales, Spines, &c. It is, of whatever form, conſiſtence, or texture, a varied continuation of the *Cortex*, or external bark of the plant. The ſimple Cup commonly conſiſts of one, two, or more pieces; and in every caſe ſerves the purpoſes of ſupport and defence. If it be only one piece it is divided into ſeveral ſegments, diviſions, or teeth, commonly correſponding with the number of *Threads*, but oftener with that of the *Petals*. If of more than *one* piece, they uſually anſwer to the petals. Compound and headed flowers are made up of many florets, and the Cup conſiſts of many pieces.

The Cup is ſaid to be *caducous*, or ſoon falling off, as in the Poppy; *deciduous*, or falling with the bloſſom, as in the Stock; *marceſcent*, withering but not falling off, as in the Apple; and *perſiſtent*, or remaining in vigour till the fruit is ripe, as in the Winter Cherry, and all the Nightſhades.

III. The Blossom, Petals, or Flower Leaves (*Corolla*).

Theſe are ſupported by, and contained within, the Cup; and compoſe the internal covering of the *Threads*, *Style*, and *Seed-Bud*. Its various forms and diviſions have been already deſcribed. Its texture is derived from the *Liber*, or internal

nal bark, but it has air veſicles in great abundance and tenuity. Its uſe is to defend the more important parts of the fructification from the external injuries of wet and cold during the night, when moſt flowers either contract, or entirely ſhut up, their petals; which action has been called the *ſleep* of plants*, as the auroral expanſion of them has been called their *waking*.

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* This is remarkable in many plants, though to be ſeen, in ſome meaſure, in all. The *Dandelion* and the *Chick-weed* are very evident inſtances of both the early and the entire cloſing up of the petals.

IV. THE THREADS OR CHIVES (*Stamina*) are ſlender bodies ariſing from, and uniting to, various parts of the fructification: they conſiſt of two parts—the *Thread* and

Night is not the only ſeaſon of the ſleep of plants: wet and cold days will cauſe it. In ſome plants bearing flowers of red, deep bright yellow, and fiery colours, as the *Orange Lily*, *Marygold*, &c. before the ſetting of the ſun, in fine and calm evenings, a flame or atmoſphere of electric fire may be perceived to iſſue from the petals, eſpecially after remarkably warm days.

the *Tip*, called by LINNÆUS the *Stamen* and *Anthera* *. The Thread, or Filament, is a ſlender, erect little body, commonly white, and tapering to a point, ſupporting on its ſummit the *Tip* or *Anthera*, variouſly coloured, and commonly very beautifully impregnated with a fine meal called *Pollen*, a ſeries of ſmall globular bodies containing a ſubtil elaſtic vapour, which is the fecundating cauſe of vegetation. The *Stamina*, conſiſting of the *Thread* and the *Tip*, derive their origin from the wood (probably from its more internal *Lamellæ*), and conſtitute the male part of vegetable bodies.

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* Termed by the ingenious profeſſor MARTYN, *Anther*, as a word of obliging accomodation.

V. THE STYLE, or POINTAL (*Piſtillum*), is the erect column which riſes in the center of the flower, and conſtitutes the female part of the fructification. It conſiſts of three parts: the *Seed Bud* (*Germen*); the *Style* (*Stylus*); and the *Summit*

(*Stigma*), or Capital which crowns it.

The *Tip* of the *Thread* prepares the *Pollen*, which, when ripe, falls, or is blown upon, or conveyed by bees and other inſects to, the *Summit* of the *Style*, the moiſt and ſpongy top of which receives and detains it, till burſting, the elaſtic vapour it contains is conveyed through the Style to the *Seed Bud*, by which the latter is impregnated; and thus is the operation of vegetable propagation performed*!

The

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* The ſeed bud contains the rudiments of the ſeeds or fruit, which, unimpregnated by

The *Style* originates from the *Pith* of the plant, as is manifeſt from its central ſituation, and ſpongy texture.

There is, moreover, to many flowers an appendage, which is called the HONEY-CUP (*Nectarium* *), con-

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the *Pollen*, muſt remain barren and abortive—never arriving to maturity; or, if *apparently* perfected, yet incapable of vegetation and reproduction: but, if fecundated by the *Pollen*, they immediately become prolific, ſwell, and proceed to perfection. This wonderful operation is clearly ſeen in the *Cucumber*,—and is well known to gardeners, in what they call the *ſetting of the fruit*.

* Called by profeſſor MARTYN, *Nectary*.

× There is scarcely a flower existing which does not secrete some honey. Its qualities are different in diff^{t}. kinds of plants. Its use is suppos'd to be for the purpose of tempting insects to assist in rendering the flower prolific. The honey cup is generally so contriv'd as to admit the mout of the insect within it, and at the time it is sucking the honey, by the motion of its body & legs which are in general very rough the impregnating dust (which is call'd in botanical language) the pollen is brush'd upon the pistillum or female part of the flower.

Sometimes the honey is poisonous to men & other large animals, but not to insects. It most generally happens that those plants which are poisonous to us & Quadrupeds are those on which the insect tribe feed the most.

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taining a ſmall quantity of ſweet, honey-like juice, whence *honey* is made, as is *wax* from the Pollen. In ſome flowers, as the *Indian Naſturtium*, *Columbine*, *Larkſpur*, &c. it is conſpicuous; in others, it is leſs viſible, and ſituated in divers, and often obſcure, parts of the fructification; and ſome plants appear entirely to want it. Its uſe is ſuppoſed to be that of a reſervoir for the nouriſhment of the tender ſeed-bud, or by inviting bees, and other inſects, to promote the diſperſion of

Pollen, and thereby to aſſiſt and facilitate the impregnation of it.

VI. The Seed Vessel (*Pericarpium**) is the *Seed Bud* in a ſtate of gravidity, which before was virgin and barren. It is properly the pregnant uterus of the plant. Some plants have no ſeed veſſel, or proper cover for the fruit: in that caſe, the ſeeds are fixed to the bottom of the cup, which ſerves them for a covering and defence, in defect of

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* Termed by profeſſor Martyn, *Pericarp.*

of a *Pericarpium*; as is inſtanced in many of TOURNEFORT's *Lip-ſhaped* flowers and in all LINNÆUS's order *Gymnoſpermia.* This part ſometimes diſtinguiſhes *Species.* LINNÆUS divides the ſeed veſſel into ſeven kinds: — *Capſule. Pod. Follicle. Drupe. Apple. Berry,* and *Cone.* See the elementary treatiſes of the ſcience.

VII. THE SEEDS, OR FRUIT, are real *Eggs*; and the plants produced from them may be termed the *oviparous* part of the vegetable kingdom.

The ſeed is the eſſence of the fruit, in all fructiferous plants; and in all the ſeminiferous ones it conſtitutes the fruit itſelf, and, in either caſe, contains the rudiments of a new vegetable. Its parts are,

1. The Heart (*Corculum*); this is the principle of life in the future plant, attached to, and contained within, the Lobes: it conſiſts of two parts:—the plume (*Plumula*), and the beak (*Roſtellum*). The former aſcends, and forms the ſtem

of the plant; and the latter deſcends, and forms the root.

2. The Side-Lobes (*Cotyledones*). Theſe ſupply the heart with nouriſhment till it is capable of extracting it from the earth. In moſt plants they aſcend in the form of leaves, thence called *ear*, *ſeminal*, or *radical leaves*; but in many inſtances they remain beneath the ſurface, and there periſh. Some plants have but one lobe, but moſt have two. They ſerve the purpoſes, at firſt, of a *placenta*, and afterwards of *breaſts*, to the embryo plant.

3. The Scar *(Hilum)*. This is an external mark where the ſeed was faſtened within the fruit.

4. The Seed-Coat *(Arillus)* is a proper cover to ſome ſeeds. It is of various texture and conſiſtence in different individuals.

5. The Crown *(Pappus)* is a feathery down, with which the Dandelion, Thiſtle, and many compound and headed flowers, are furniſhed, for the conveyance of their ſeeds.

6. The Wings *(Alæ)* are a membranous cover or appendage to ſome ſeeds,

ſeeds, by which they are tranſported by the wind to great diſtances from their native ſpot, and thereby widely diſperſed.

Linnæus has divided the fructification of plants into twenty-five * Classes or larger diviſions, moſtly founded on the number of *Threads* or male parts †. Theſe are again ſubdivided into Orders or ſecondary diviſions, founded on the *Styles*, or female parts; and where theſe are wanting the ſummits are taken for them; in that caſe they ſit immediately upon the ſeed-bud, as in the Poppy, to which they form a ſort of crown.

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* Including the Palms, an appendix to the other twenty-four claſſes.

† Such flowers as contain *Threads* only are called male; thoſe which have *Styles* only are called female; thoſe that have *both*, in one flower, are termed hermaphrodites; and ſuch

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ſuch as have only *petals*, without either, are called neuter.

When the flower is ſeated upon the fruit, as in the cucumber, it is ſaid to be *ſuperior*, and the fruit inferior, reſpecting each other; but when the flower is inſerted beneath the fruit, as in the pink, it is then ſaid to be *inferior*, and the fruit or ſeed-bud ſuperior.

The first 20 claſses include such plants as bear hermaphrodite flowers; i.e. having stamina & pistilla within the same calyx or petals; or on the same receptacle where these are wanting. Again the first eleven of these claſses are founded solely upon the number of the stamina —

The orders are generally founded on the number of styles at least in the 13 first claſses (see page 80.)

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The names of the claſſes and orders are compoſed of two *Greek* words, ingeniouſly and deſcriptively combined, as in the following ſcheme.

CLASS I. *Monandria.* This term implies *one male.* The claſs conſiſts of flowers containing only *one Thread.*

CLASS II. DIANDRIA. This implies *two males*; and ſignifies the claſs to conſiſt of flowers of *two Threads.*

CLASS III. TRIANDRIA *(three males). Three Threads.*

Class IV. Tetrandria (*four males*). *Four Threads.*

Class V. Pentandria (*five males*). *Five Threads.* ×

Class VI. Hexandria (*six males*). *Six Threads.*

Class VII. Heptandria (*seven males*). *Seven Threads.* ‡

Class VIII. Octandria (*eight males*). *Eight Threads.*

Class IX. Enneandria (*nine males*). *Nine Threads.*

Class X. Decandria (*ten males*). *Ten Threads.*

× This is a very numerous class

‡ This is a very small class

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CLASS XI. DODECANDRIA *(twelve males)*. *Twelve Threads.* Yet the number of threads is not the invariable characteriſtic of this claſs, as is the caſe in all the former ones. Some flowers in this contain more, and ſome fewer *, than twelve. The character of it then muſt depend on ſome other circumſtance, and is eſtabliſhed on one that is invariably conſtant; namely, that *the Threads*

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* There is, I believe, only *one* inſtance (in the *Brownea*) where the flower has *eleven* threads.

are all fixed to the Baſe or *Receptacle.*

CLASS XII. ICOSANDRIA (*twenty males*). *Twenty Threads.* Neither is this claſs ſtrictly aſcertained by the number of its threads :—it commonly contains that number, but this circumſtance is not conſtant. Its genuine mark is, that its *Threads ſtand upon the ſides of the Cup* (and ſometimes, *in part, upon the Bloſſom*), whereas the former, as well as the following, claſs is known by their ſtanding on the *Receptacle.* Moreover it is diſtinguiſhed by *the Cup*

conſiſting

‡ The essential character of this class is that the stamina (or threads) are always inserted into the calyx as in the Pear, peach &c: This mode of insertion indicates wholesome fruit (even in other classes) tho' the leaves & other parts of the plant are poisonous.

* The plants belonging to this class are usually of a poisonous nature.

When the nectarium or honey cup is distinct from the petals or flower leaves the plant is always poisonous.

conſiſting of one concave Leaf, and the Petals fixed by their Claws likewiſe to the ſides of the Cup.

CLASS XIII. POLYANDRIA (*many males*). *Many Threads.* This claſs is diſtinguiſhed by its numerous *Threads being all fixed to the Baſe, or Receptacle*—not to the cup.

CLASS XIV. DIDYNAMIA*. This

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* This and the following claſſes are not noted by their *Threads*, as in the preceding ones, in reſpect of *number*; but in their *proportion* to each other, and in the manner of their *union*. The orders alſo depend not on the *Style*, but on ſome other circumſtances, and on the *Threads*.

term implies *the power or ſuperiority of two*. The claſs conſiſts of *Lip-ſhaped* flowers having *four Threads*, of which *two are long*, and *two are ſhort*; and, in this reſpect, are diſtinguiſhed from the following claſs.

Class XV. Tetradynamia.

This term ſignifies *the power, or ſuperiority of four*. The claſs conſiſts of *Croſs-ſhaped* flowers, each having *ſix Threads*, of which *four are long, and two are ſhort.*

Class XVI. Monadelphia.

× This claſs has only two orders. Those plants which belong to the first are wholesome — those which belong to the second are poisonous. (see page 87.)

* There is only one plant belonging to this claſs which is said to be poisonous & that is the wild radish

+ those of the pea-kind &c:

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This term imports *one Brotherhood.* In this claſs the *Threads are all united together at the bottom, but ſeparate at the top.* The Mallow-tribe diſtinguiſh it.

CLASS XVII. DIADELPHIA. *Two Brotherhoods.* This claſs acknowledges the *Butterfly-ſhaped* flowers containing *ten Threads*; nine (generally) of which are united together into one bundle or brotherhood, below, and ſeparate above;—and the tenth, with the ſtyle, form another bundle, or brotherhood.

CLASS XVIII. POLYADELPHIA. *Many Brotherhoods.* This claſs conſiſts of flowers having their Threads bound together into three or more bundles, or brotherhoods.

CLASS XIX. SYNGENESIA. This term implies *congeneration*, or *polygamy*. The claſs conſiſts of flowers, generally compound, whoſe ſummits are united into a cylinder.

CLASS XX. GYNANDRIA. This term ſignifies *a male and a female.* The claſs is diſtinguiſhed by the *Threads ſtanding upon the Style* (or a

* The flowers of this class only expand for a few hours & that in the middle of the day: when it is cloudy they remain shut.

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baſe lengthened ſo as to reſemble a ſhaft, ſupporting both *Style* and *Threads*, and entering into part of the pointal). The Paſſion-flower exhibits a clear idea of it.

Class XXI. Monoecia. This term denotes *one houſe*. All the plants compoſing the former claſſes conſiſt of flowers containing both *Thread* and *Style* in the ſame flower; —but thoſe of this claſs *have Threads in one flower and Styles in another, on the ſame root, and in the ſame plant.*

Class XXII. Dioecia. *Two houſes*. This claſs contains *flowers of* *of different ſexes, on different plants.* Male flowers on one plant, and females on another *.

CLASS XXIII. POLYGAMIA. This term ſignifies *plurality of marriage.* The claſs conſiſts of *flowers which have Threads and Styles in ſeparate flowers, as well as both in the ſame flower, on one or on different plants.*

CLASS XXIV. CRYPTOGAMIA. This term implies *hidden or clandeſtine*

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* Theſe are termed *male* and *female* plants; and ſuch as bear both ſexes of flowers diſtinct are termed *Anarogynous*, i. e. bearing both male and female flowers.

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Spadix — Spathe

* Spadix is the peduncle or stalk which proceeds from the spathe.

* Spathe a kind of Calyx or flower cup resembling a sheath, as in Narcissus

tine marriage. The claſs conſiſts of ſuch flowers as are either in their ſtructure obſcure, or, by reaſon of their minuteneſs, *inviſible to the unaſſiſted eye.* as in the Fern &c:

CLASS XXV. PALMS. Theſe LINNÆUS has called *the Princes of* INDIA, and has given them a ſeparate claſs, as being not yet ſufficiently underſtood to be claſſed in the foregoing arrangement. They riſe to a prodigious magnitude and procerity, have a very majeſtic appearance, and produce their fructification in a *Spadix,*# clothed with a *Spathe.*×

Theſe are the Classes of the Linnæan ſyſtem, or larger and primarary diviſions of plants:—we now come to their Orders, or ſecondary diviſions. (vide page 68)

Class I. Monandria, Has two Orders.

1. *Monogynia.* One Style, or Female.

2. *Digynia.* Two Styles, or Females *.

Class

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* There are as many ſtyles as ſeed-veſſels, if the ſtyles be cloven *quite to the bottom,* and ſtand ſeparate; but where there are ſeveral cells

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Polypetalous flowers
flowers of many
petals

Sumach
a plant.

CLASS II. DIANDRIA. Three Orders.

1. *Monogynia.*

2. *Digynia.*

3. *Trigynia.* Three Styles.

CLASS III. TRIANDRIA. Three Orders.

The ſame as Claſs II.

cells or partitions to the ſeed veſſel, the ſtyle is cloven into the ſame number of parts, but only to a certain length; and is *entire at the bottom*. Yet in ſome inſtances, the ſeed veſſels are ſo cloſely united as to form but one body, though the ſtyles are diſtinct and ſeparate; as in the *Nigella:* in this caſe the ſeparated ſtyles proclaim the number of ſeed veſſels, though apparently but *one*.

CLASS IV. TETRANDRIA. Three Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Tetragynia.* Four Styles.

CLASS V. PENTANDRIA. Six Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Trigynia.* The passiflora belongs here.
4. *Tetragynia.*
5. *Pentagynia.* Five Styles.
6. *Polygynia.* Many Styles.

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‡ This order contains but one & very singular genus: the calyx or flower cup is divided into 7 parts – the petals or flower leaves are 7 in number — it has seven germens, & seven capsules.

CLASS VI. HEXANDRIA. Five Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Trigynia.*
4. *Tetragynia.*
5. *Polygynia.*

CLASS VII. HEPTANDRIA. Four Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Tetragynia.*
4. *Heptagynia.* Seven Styles. ‡

CLASS VIII. OCTANDRIA. Four Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Trigynia.*
4. *Tetragynia.*

CLASS IX. ENNEANDRIA. Three Orders.

1. *Monogynia.*
2. *Trigynia.*
3. *Hexagynia.*

CLASS X. DECANDRIA. Five Orders.

[illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

3. [illegible]
4. [illegible]

[illegible]

[illegible]

[illegible]

1. *Monogynia.*

2. *Digynia.*

3. *Trigynia.*

4. *Pentagynia.*

5. *Decagynia.* Ten Styles.

CLASS XI. DODECANDRIA. Five Orders.

1. *Monogynia.*

2. *Digynia.*

3. *Trigynia.*

4. *Pentagynia.*

5. *Dodecagynia.* Eleven Styles.

CLASS XII. ICOSANDRIA. Five Orders. (see page 72.)

1. *Monogynia.*
2. *Digynia.*
3. *Trigynia.*
4. *Pentagynia.*
5. *Polygynia.*

CLASS XIII. POLYANDRIA. Seven Orders.

1. *Monogynia.*
2. *Digynia.*
3. *Trigynia.*
4. *Tetragynia.*
5. *Pentagynia.*
6. *Hexagynia.*
7. *Polygynia.*

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5 JY 62

+ They are wholesome aromatic plants

++ These are generally fœtid & poisonous plants.

Capsule
a little seed
Box

Class XIV. Didynamia[*]. Two Orders.

1. *Gymnoſpermia.*

This order has, in each flower, four naked ſeeds fixed to the bottom of the cup, without any ſeed-veſſel.

2. *Angioſpermia.*

This order includes its ſeeds in a ſeed-veſſel, which is a capſule.

Class XV. Tetradynamia. Two orders.

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[*] Theſe two claſſes diſtinguiſh their orders, not by ſtyles, but by the fruit; and the three ſucceeding ones, by the number of ſtamina.

1. *Siliculoſa.*

This order contains its ſeeds in a ſhort, roundiſh pod, or pouch.

2. *Siliquoſa.*

This order contains its ſeeds in a long ſlender pod.

CLASS XVI. MONADELPHIA.

Eight Orders.

1. *Triandria.*
2. *Pentandria.*
3. *Octandria.*
4. *Enneandria.*
5. *Decandria.*
6. *Endecandria.* Eleven Stamina.

* the plants of this order are scarcely any of them poisonous to the larger animals — tho' there is a kind of vetch which if thrown into the water where there are fish, it will intoxicate them.

7. *Dodecandria.*
8. *Polyandria.*

CLASS XVII. DIADELPHIA. Four Orders.

1. *Pentandria.*
2. *Hexandria.*
3. *Octandria.*
4. *Decandria.* ✱

CLASS XVIII. POLYADELPHIA. Three Orders.

1. *Pentandria.*
2. *Icoſandria.*
3. *Polyandria.*

CLASS XIX. SYNGENESIA. Six Orders.

1. *Polygamia Æqualis.* Equal Polygamy.

This order conſiſts of flowers having hermaphrodite florets, containing both *Threads* and *Style*. Example, *Dandelion*.

2. *Polygamia Superflua.* Superfluous Polygamy.

This order contains compound flowers of the *ſtar* kind, having tubular hermaphrodite florets in the center, and ſtrap-ſhaped females in the

Aster

a plant

the circumference *; therefore *ſuperfluous.* Examples, *Aſter* and *Daiſy.*

3. *Polygamia Fruſtranea.* Uſeleſs Polygamy.

This order contains compound flowers bearing tubular, hermaphrodite florets in the center, and only open or flat, empty, bloſſoms in the circumference, having neither *Thread* nor *Style:* hence *uſeleſs* to the fructification.

---

[*] In many articles of this order, there are no flat florets; example *Tanſey* and *Groundſell:* and in ſome others only a few.

tification. Example, *Blue-bottle*, and ſome *Sunflowers.*

4. *Polygamia Neceſſaria.* Neceſſary Polygamy.

This order conſiſts of flowers having tubular, hermaphrodite florets in the center, and flat ſtrap-ſhaped females in the circumference.

But by reaſon of ſome defect in the central Styles, they produce no ſeed; therefore the circumferential females are *neceſſary* to the fructification, which only produce perfect ſeeds; and without which, the flower would

would be barren. Example, *Mary-gold.*

5. *Polygamia Segregata.* Separate Polygamy.

This order contains flowers having both Threads and Styles, each having its ſeparate cup, yet all contained in one common cup, or calyx. Example, *Globe-thiſtle.*

6. *Monogamia.* Single marriage.

This order includes hermaphrodite flowers of the ſimple kind—each having its own proper cup and footſtalk. Example, *Violet.*

CLASS XX. GYNANDRIA*. Eight Orders.

1. *Diandria.*
2. *Triandria.*
3. *Tetrandria.*
4. *Pentandria.*
5. *Hexandria.*
6. *Decandria.*
7. *Dodecandria.*
8. *Polyandria.*

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* This and the two following claſſes depend not on the *Stamina* for their claſſical character, but on ſome other circumſtance; therefore the *Threads*, reſpecting their number, ſituation, and union, become characteriſtic of their ſeveral Orders.

CLASS XXI. MONOECIA. Eleven Orders.

1. *Monandria.*
2. *Diandria.*
3. *Triandria.*
4. *Tetrandria.*
5. *Pentandria.*
6. *Hexandria.*
7. *Heptandria.*
8. *Polyandria.*
9. *Monadelphia.*
10. *Syngeneſia.*
11. *Gynandria.*

CLASS XXII. DIOECIA. Fourteen Orders.

1. *Monandria.*
2. *Diandria.*
3. *Triandria.*
4. *Tetrandria.*
5. *Pentandria.*
6. *Hexandria.*
7. *Octandria.*
8. *Enneandria.*
9. *Decandria.*
10. *Dodecandria.*
11. *Polyandria.*
12. *Monadelphia.*

13. *Syngeneſia.*
14. *Gynandria.*

CLASS XXIII. POLYGAMIA.

Three Orders.

1. *Monoecia.*
2. *Dioecia.*
3. *Trioecia.*

CLASS XXIV. CRYPTOGAMIA.

Four Orders.

1. *Ferns.*
2. *Moſſes.*
3. *Flags.*
4. *Funguſes.*

The Inflorescence of plants, or the ſeveral modes in which they produce their flowers, is a very curious ſubject; I ſhall, therefore, conclude this piece with a brief deſcription of it. It conſiſts of ten kinds, as follows.

I. A Bundle *(Faſciculus)* is a mode of flowering in which the flowerſtalks are erect, parallel, placed cloſe to each other, and raiſed to the ſame height; as in the *Sweet William.*

[illegible]

H. A. [illegible]

[illegible]

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II. A Cluster (*Corymbus*) is a tuft of flowers in which the partial flowerſtalks are produced along the common ſtalk on both ſides; and, though of unequal lengths, riſe to the ſame height, and form a flat and even ſurface. It is exemplified in the *Single Stock* and *Wall Flower* *.

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* Of this ſort is a cluſter of flowers which are of an obtuſe conical form; or, in ſome inſtances, rather inclining to that of an ovate one: the *Lilac* and *Butterbur* are examples of it. Linnæus has called it Thyrsus, which, as the term implies a *Cluſter*, I have,

III. A CYME *(Cyma)* is a form of flowering in which ſeveral common footſtalks riſe in a radiate form from a fixed point, and again divide into many partial ones ariſing from no fixed point, and diſtributed in no regular order, yet forming a flat, even ſurface. The *Elder* and *Lauruſtinus* are inſtances of it.

IV. A LITTLE HEAD *(Capitulum)* is a knob of flowers of a round form, conſiſting of many

to avoid confuſion, not given it a ſeparate place, as we have no proper Engliſh term for it.

individuals

individuals united by ſeparate footſtalks iſſuing from the common one into one body. It is exemplified in the *Thrift*, and the *Globe Amaranthus.*

V. A Bunch (*Racemus*) is a mode of flowering wherein each individual is ſituated on the ſide of the common flowerſtalk, and appended to it by partial ones, reſembling lateral branches. It is ſeen in the *Vine* and *Currant Buſh.*

VI. A Panicle (*Panicula*) conſiſts,

conſiſts of flowers looſely diſperſed upon partial footſtalks variouſly ſubdivided, and all iſſuing from the common footſtalk. Examples, *Oats* and *Panic Graſs*.

VII. A Spike (*Spica*) is a form of flowering in which the flowers are placed alternately on each ſide of the common flowerſtalk, to which they immediately adhere without any partial footſtalk, or, in ſome inſtances, very ſhort ones, which are called ſpikeſtalks. Examples, many of the *Graſſes* and *Wheat*.

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This is a species of Inflorescence very important, for many of the umbelliferous plants are very various in their qualities, & distinct in their nature. Those which grow in moist soils are poisonous, while on the contrary those which grow in dry soils are generally aromatic & wholesome. ——

VIII. An Umbel *(Umbella)* is a form of infloreſcence in which a number of footſtalks proceed from one point, in the manner of the ſpokes of a wheel, in a very exact and regular order: theſe again ſupport other ſmaller ones, which alſo diverge in the ſame regular and exact form; each of which ſupport a flower, having five petals, five threads, and two ſtyles; the whole forming a flattiſh, ſomewhat convex ſurface, reſembling an *umbrella*: theſe are followed by two united ſeeds, which, when ripe, divide from each other. The larger diviſion of footſtalks is called the *general* umbel, and the ſmaller ones, the *partial* umbel. It is exemplified in the *Parſnip*, *Carrot*, *Fennel*, and *Parſley*.

IX. A Whorl or Whirl *(Verticillus)* conſiſts of ſeveral (generally five) *Lip-ſhaped* flowers ſtanding on ſhort footſtalks, and ſurrounding each joint of the ſtem like a ring. It is inſtanced in the *Lupine*, *Mint*, and *Horehound*.

X. A Spadix is a fructification concealed in a membranous ſheath, termed a *Spathe,* which, when the fructification is perfect, opens longitudinally to diſplay it, without any *Calyx.* It is magnificently exemplified in the Palms, and is inſtanced in the *Arums.*

The Physiology [*] and Pathology

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[*] I take the liberty of recommending to the curious Botanical Tyro who wiſhes to be informed concerning the ſtructure of vegetable bodies, and their uſes and connections in regard to each other, The Anatomy of Plants by that eminent vegetable Phyſiologiſt

LOGY of plants come not within the compaſs of an *outline* to treat of: they compoſe one great branch of the PHILOSOPHY of Botany, that wide and delightful field for the diſplay of genius, and the exerciſe of contemplative powers! Detached parts of it may be ſeen in the works of ſeveral authors who have written concerning plants, either in a botanical or horticultural way: but the ſubject is accurately delineated, and

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logiſt and Anatomiſt, Dr. NEHEMIAH GREW.

[illegible]

[illegible] Government of Russia, [illegible]

[illegible]

[illegible] flowering plants, either in a bota-
nical or horticultural way; but [illegible]
[illegible] is accurately described, and

[illegible] Northern
[illegible]

[illegible]

professedly diſcuſſed, by the great LINNÆUS, in his PHILOSOPHIA BOTANICA, a work of immenſe merit, and in ſeveral other treatiſes of the ſame author now happily tranſlated into our own language; of which no pretender to the ſcience ſhould be ignorant.

THE END.

Fig: 1.

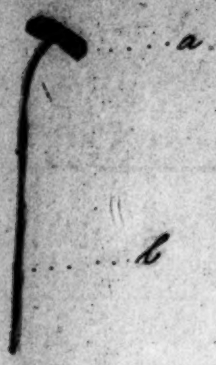


Fig: 2.

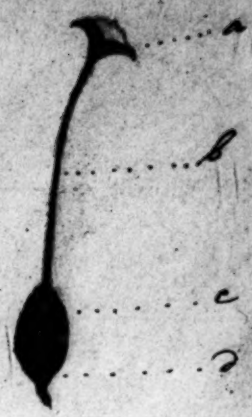


Fig: 1.

a. Anthera. This part contains the pollen, or impregnating dust.

b. Filament.

Fig. 2.

a. Stigma

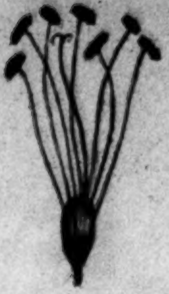
b. The style. This part is sometimes wanting, as in the Tulip &c:

c. The Germen, or seed-bud which contains the seeds. This part whe grown to maturity is call'd Pericarpium, and is the fruit whi we eat, as the pear &c: —

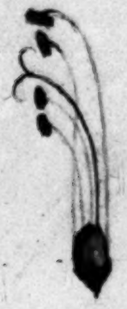
d. Perianthium, calyx, or Flower cu

Double flowers are consider'd by Botanists as monsters having the Stamens & Pistils converted into peta therefore cannot be propagated by only by slips or cuttings.

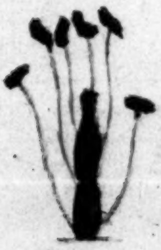
Claſs 7th



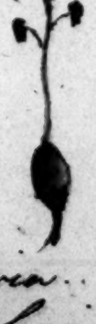
Heptandria. Monogynia. Flowers which bear 7 Stamens, & one Pistil.



Claſs 14. Didynamia. The flowers of this claſs have four stamens. Two long & two short.



Claſs 15th Tetradynamia. The flowers of this claſs have six Stamens, four of which are longer than the two others



Claſs 20. Gynandria. This claſs is disting from the others by having the stamens g out of the Pistil.